

DTIC FILE COPY

2

AD-A232 910

**ANTI-ARMOR DEFENSE DATA STUDY
(A2D2)**

"HOW TO RESEARCH" GUIDE

15 FEBRUARY 1991



Science Applications International Corporation
An Employee-Owned Company

**DTIC
ELECTE
MAR 14 1991
S B D**

DISTRIBUTION STATEMENT A

**Approved for public release
Distribution Unlimited**

91 3 11 068

2

ANTI-ARMOR DEFENSE DATA STUDY
(A2D2)

"HOW TO RESEARCH" GUIDE

15 FEBRUARY 1991

PREPARED FOR
THE US ARMY CONCEPTS ANALYSIS AGENCY
UNDER
CONTRACT NUMBER DAAL01-90-C-0071
DELIVERY ORDER 3

DTIC
ELECTE
MAR 14 1991
S B D

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Military Operations Analysis Division
1710 Goodridge Drive, T1-7-2
McLean, Virginia 22102

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188
Exp Date Jun 30 1986

1a. REPORT SECURITY CLASSIFICATION Unclassified			1b. RESTRICTIVE MARKINGS None		
2a. SECURITY CLASSIFICATION AUTHORITY N/A			3. DISTRIBUTION/AVAILABILITY OF REPORT Unlimited		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) SAIC 91-1012			5. MONITORING ORGANIZATION REPORT NUMBER(S) to be assigned		
6a. NAME OF PERFORMING ORGANIZATION Science Applications Intl Corp		6b. OFFICE SYMBOL (if applicable) SAIC	7a. NAME OF MONITORING ORGANIZATION US Army Concepts Analysis Agency		
6c. ADDRESS (City, State, and ZIP Code) 1710 Goodridge Dr., McLean, VA 22102 T1-7-2			7b. ADDRESS (City, State, and ZIP Code) 8120 Woodmont Ave. Bethesda, MD 20814-2797		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION US Army Concepts Analysis Agny		8b. OFFICE SYMBOL (if applicable) CSCA-MVM	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DAAL01-90-C-0071 D.O. 3		
8c. ADDRESS (City, State, and ZIP Code) 8120 Woodmont Ave., Bethesda, MD 20814-2797			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
11. TITLE (Include Security Classification) Anti-Armor Defense Data Study (A2D2), Vol IV-US Anti-Tank Defense At Krinkelt-Rocherath, BE					
12. PERSONAL AUTHOR(S) Young, Victoria; Baily, Charles; Karamales, Lloyd J.; Boykin, Joyce B.					
13a. TYPE OF REPORT Technical Report		13b. TIME COVERED FROM 11/90 TO 1/91		14. DATE OF REPORT (Year, Month, Day) 15 February 1991	
15. PAGE COUNT					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Anti-armor, WWII, historical analysis, weapon degradation, database		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The objective of the effort was to collect historical data on at least fourteen actions where the US was in defense of enemy armor. The data will be used in a joint US/UK analysis of the degradation in anti-armor defense effectiveness under combat conditions. 29 combat actions were described in detail from the engagement at Krinkelt-Rocherath, Belgium in December 1944. The combat actions are presented in both narrative form and in data tables with all identified data displayed. A database and hard copy file will also be delivered as a final product. This volume also contains a "How To Research" Guide describing the necessary information to successfully conduct research for this study.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Dr. Robert Helmbold			22b. TELEPHONE (Include Area Code) (301) 295-6992		22c. OFFICE SYMBOL CSCA-MVM

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.1	GENERAL.....	1
1.2	ENGAGEMENTS RELEVANT TO A2D2.....	1
1.3	SOURCE DATA LOCATIONS AND THEIR USAGE.....	6
1.3.1	Washington National Records Center, Suitland, MD.....	6
1.3.2	National Archives and Record Service, Washington, DC..	9
1.3.3	US Army Center of Military History, Washington, DC....	10
1.3.4	US Army Infantry Center and School, Ft. Benning, GA... 11	
1.3.5	US Army Armor Center and School, Ft. Knox, KY.....	12
1.3.6	The Library of Congress, Washington, DC.....	13
1.3.7	German Archives.....	13
1.3.8	US Army Military History Institute, Carlisle, PA.....	14
1.3.9	The Pentagon Library, Washington, DC.....	15
1.3.10	Ft. Belvoir Library, Ft. Belvoir, VA.....	15
1.3.11	US Military Academy, West Point, NY.....	16
1.3.12	US Army Artillery Center and School, Ft. Sill, OK.....	16
1.3.13	US Army Combat Studies Institute, Ft. Leavenworth, KS.	16
1.3.14	US Air War College, Maxwell Air Force Base, AL.....	17
1.3.15	US Army Combat Developments Experimentation Command, Ft. Ord, CA.....	17
1.3.16	Network of World War II Veterans.....	17
1.4	DATA COLLECTION OBJECTIVES.....	18
1.5	DEVELOPING AN ENGAGEMENT DATABASE.....	19
1.6	DETERMINING WHAT IS AN "ACTION".....	20
1.7	THE FILING SYSTEM.....	20

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



LIST OF TABLES

TABLE	TITLE	PAGE
1-1	LIST OF ENGAGEMENTS.....	2
1-2	ORDERING OF ENGAGEMENTS.....	4
1-3	SOURCE DATA LOCATIONS.....	5
1-4	DATA COLLECTION OBJECTIVES.....	19

"HOW TO RESEARCH" GUIDE FOR THE ANTI-ARMOR DATA DEFENSE (A2D2) STUDY

1.1 GENERAL

This guide provides details and instructions necessary to gather data for research on the Anti-Armor Defense Data (A2D2) Study. Accessing, researching, and compiling data will be discussed.

1.2 ENGAGEMENTS RELEVANT TO A2D2

In the initial stage of this study, SAIC expanded the list of 30 engagements that were provided with the Statement of Work. SAIC added an additional 16 engagements that were felt to have potential for developing anti-tank actions. Table 1-1 lists the 30 engagements identified by CMH (1 to 30) and the additional 16 added by SAIC (31 to 46).

Preliminary research and structured evaluation led to a prioritized list of 46 engagements for collecting the required data. Table 1-2 shows the list of engagements in order of the amount of information expected to be gathered from each one. The SAIC Report titled Anti-Armor Defense Data Study (A2D2) Phase I, Final Report Volume I -- Technical Report, dated March 30, 1990, describes in detail the process for developing this list.

To date, St. Barthelmy, L'Abbaye Blanche, Dom Bütgenbach, and Krinkelt-Rocherath have been researched and actions described. These can be found in Volume II -- US Anti-Tank Defense at Mortain, France (August, 1944) dated March 30, 1990, Volume III -- US Anti-Tank Defense at Dom Bütgenbach, Belgium (December, 1944) dated 10 October 1990, and Volume IV -- US Anti-Tank Defense at Krinkelt-Rocherath (December, 1944) dated 18 January 1990 (Draft).

After selecting the engagement to be researched, the US Army's Official Histories of World War II (commonly known as the Green Books) may be used to locate which units were involved by looking up a particular engagement in the index. The descriptions given in these volumes also reference other sources such as manuscripts which frequently contain detailed information.

TABLE 1-1. LIST OF ENGAGEMENTS

ENGAGEMENT	LOCATION	DATE	UNIT(S) INVOLVED
1	Sbeitla, Tunisia	17 February 1943	601st Tank Destroyer Battalion: German: Elements of Group Stenkhoff, 21st Panzer Div
2	Sbeitla, Tunisia	17 February 1943	2/13th Armored Regiment and 27th AFA Bn; German: Elements of Group Stenkhoff, 21st PD
3	El Guettar, N. Africa	23 March 1943	601st TD Battalion; 899th TD Battalion; various Bns of 16th and 18th Inf, 1st Div
4	Djebel el Guessa, N. Africa	6 December 1943	Battery C, 27th AFA Battalion
5	St. Jean-de-Daye, France	9 July 1944	Company C, 823d TD Battalion, attached to 30th Infantry Division
6		11 July 1944	823d Tank Destroyer Battalion; 39th and 47th Infantry Regiments
7	Notre Dame-de-Cenilly, France	29 July 1944	1 co armd infantry, 1 tank co of 41st Armd Infantry, Cmbt Cmd B, 2d Arm'd Div; German: Elements of 2d SS-PD, 17th SS Eng Bn, 5th Parachute Regt, 17th SS-PGD
8	Near #7	29 July 1944	1 co from 4th Div inf bn atchd to 2d Arm'd Div, 78th AFA Bn, elements of 702d TDBN
9	Near St Denis-le-Gast, France	29 July 1944	Elements of same units as in Actions 7, 8
10	Hill 317, Mortain, France	7-12 August 1944	2/120th Infantry, 30th Division; Company K from 3/120th Infantry
11	Abbaye Blanche, France	7-12 August 1944	1st Platoon, Antitank Company, 120th Infantry
12	Arnaville, France	10 September 1944	Company C, 1/10th Infantry, 5th Infantry Division
13	Dieulouard Bridgehead, France	13 September 1944	Elements of 317th and 318th Infantry Regiments; 702d Tank Bn; 313 Field Arty Bn German: Elements of 3d Panzer Grenadier Division
14	Luneville, France	18 September 1944	42d Cavalry Squadron, 2d Cavalry Group, XII Corps
15	Schmidt, France	4 November 1944	Companies L and K, 3/112th Infantry, 28th Infantry Division
16	Kommerscheidt, Germany	4 November 1944	3/110th Infantry, 28th Infantry Division, and others
17	Distroff, Germany	15 November 1944	2/358th Inf, 90th Inf Div; 712th Tank Bn and 773d TDBN; German: 25th PGD
18	Lucherberg, Germany	5 December 1944	Company F, 145th Infantry, 104th ID; German: 8th Regt, 3d Parachute Div
19	Murringen, Belgium	17 December 1944	Company E, 2/394th Infantry, 99th Infantry Division
20	Krinkelter Wald, Belgium	17 December 1944	3/23d Infantry, 2d Infantry Division
21	Rocherath, Belgium	17 December 1944	1/9th Infantry 2d Infantry Division; with three guns from 644th TD Battalion
22	Dom Bütgenbach, Belgium	19-22 December 1944	2/26th Inf, 1st Inf Div; 5th FA Bn, 33d FA Bn; 26th Cmbt Team; 634th TDBN
23	Hotton, Belgium	21 December 1944	51st Combat Engineer Battalion

TABLE 1-1. LIST OF ENGAGEMENTS CONT'D

ENGAGEMENT	LOCATION	DATE	UNIT(S) INVOLVED
24	Stoumont, Belgium	20 December 1944	1/119th Infantry, 30th Infantry Division, + 1 tank company from 740th Tank Bn
25	Longchamps, Belgium	3 January 1945	2d Battalion, 502d Parachute Infantry, 101st Airborne Division; 81st AAA Bn
26	Longchamps, Belgium	4 January 1945	Elements of 101st A/B Div; German: <u>104 Panzer Grenadier Regt, 15th PGD</u>
27	Butzdorf and Tettingen, Ger	18 January 1945	Elements of 94th Infantry Division; German: <u>11th Panzer Division</u>
28	Maison Rouge, France	24 January 1945	Company I, 3/15th Infantry, 3d Infantry Division
29	Bolsar, Germany	23-24 February 1945	406th Infantry Regiment, 102d Infantry Division; German: <u>363d Infantry Division</u>
30	Kirchboren, Germany	30 March 1945	*Task Force Richardson*, 3d Armored Division
31	St. Barthelmy (Mortain)		823d TD Battalion
32	Gela, Sicily	11 July 1943	1st ID, 2d AD, and 82d A/B
33	Salerno, Italy	13 September 1943	36th and 45th IDs
34	Anzio, Italy	16-17 Feb 1943	3d ID
35	Arnhem	9 December 1944	
36	Manhay Crossroads		7th AD, 82d A/B Div
37	Baraque de Fraiture, Belg	23 December 1944	7th AD, 82d A/B Div
38	Clervaux		28th ID
39	Marnach, Luxembourg	16 December 1944	28th ID
40	Rocheftort, Belgium	23-24 December 1944	84th ID
41	Le Gleize		30th ID
42	Stavelot, Belgium	17-19 December 1944	30th ID
43	Battle of Five Points		
44	Hosingen, Germany	January 1945	
45	Bastogne, France		
46	Heinerscheid, Luxembourg	16-17 December 1944	

TABLE 1-2. ORDERING OF ENGAGEMENTS

NO.	ENGAGEMENT
1	Dom Bütgenbach, Belgium (22)**
2	St. Barthelmy, France (31)
3	L'Abbaye Blanche, France (11)
4	Krinkelt, Belgium (20)
5	Rocherath, Belgium (21)
6	Maison Rouge, France (28)
7	Hill 314, Mortain, France (10)
8	Stoumont, Belgium (24)
9	Kommerscheidt, Germany (16)
10	Hosingen, Germany (44)
11	Bastogne, France (45)
12	Heinerscheid, Luxembourg (46)
13	Baraque de Fraiture, Belgium (37)
14	Stavelot, Belgium (42)
15	Manhay Crossroads (36)
16	Schmidt, France (15)
17	Battle of Five Points, France (43)
18	Longchamps, Belgium (25)
19	Longchamps, Belgium (26)
20	Butzdorf and Tettingen (27)
21	Anzio, Italy (34)
22	Arnaville, France (12)
23	Notre Dame-de-Cenilly, France (7)
24	Near #7 (8)
25	Salerno, Italy (33)
26	Bolsar, Germany (29)
27	Le Gleize (41)
28	Luneville, France (14)
29	Dieulouard Bridgehead, France (13)
30	Near St. Denis-le-Gast, France (9)
31	Distroff, Germany (17)
32	Lucherberg, Germany (18)
33	Kirchboren, Germany (30)
34	El Guettar, North Africa (3)
35	Hotton, Belgium (23)
36	Sbeitla, Tunisia (1)
37	Sbeitla, Tunisia (2)
38	Djebel El Guessa, North Africa (4)
39	St. Jean-de-Daye, France (5)
40	St. Jean-de-Daye, France (6)
41	Mürringen, Belgium (19)
42	Gela, Sicily (32)
43	Arnhem (35)
44	Clervaux (38)
45	Marnach, Luxembourg (39)
46	Rochefort, Belgium (40)

** Number in () indicates original engagement number

Table 1-3 shows the list initially provided by the Government requesting the minimum sources that must be surveyed. SAIC made telephone contact with the librarian/reference historian at each source location. The data collection objectives were discussed in context with the objective of the project and each source queried for potential data. Based upon these discussions, SAIC determined if a trip to the location was necessary in order to examine and collect data. The following is a summary of the source survey.

TABLE 1-3. SOURCE DATA LOCATIONS

1. National Archives and Record Service, Washington, DC
2. Washington National Records Center, Suitland, MD
3. US Army Center of Military History, Washington, DC
4. US Army Military History Institute, Carlisle, PA
5. US Military Academy (History Department Library), West Point, NY
6. US Army Infantry Center and School, Ft. Benning, GA
7. US Army Armor Center and School, Ft. Knox, KY
8. US Army Artillery Center and School, Ft. Sill, OK
9. US Army Combat Studies Institute, Ft. Leavenworth, KS
10. US Air War College, Maxwell Air Force Base, AL
11. US Army Combat Developments Experimentation Command, Ft. Ord, CA
12. German Archives, Freiburg, Germany

1.3

SOURCE DATA LOCATIONS AND THEIR USAGE

The following subsections describe SAIC's evaluation of each of the source data locations that have been used in this study and provide necessary information and hints to their usage. SAIC reproduced all material researched, whenever possible, making sure to include the title page, box reference, call number, etc. from the source. The sources appear in order of their importance and abundance of information relevant to this study.

1.3.1 Washington National Records Center, Suitland, MD

Materials: Unit records, TDBN records, Combat Interviews, Maps
Contact: Mr. Richard Boylan, Historian
Phone: (301) 763-7410

At the Washington National Records Center in Suitland (hereafter referred to as Suitland), the researcher should contact Mr. Richard Boylan, Historian, at (301) 763-7410. Mr. Boylan provided a great deal of assistance to SAIC in locating war records pertaining to this study. If Mr. Boylan is not available, the researcher should make contact with a research assistant at Suitland who is knowledgeable in the World War II area he is researching. Make an appointment with Mr. Boylan or the research assistant on the initial visit for a tour of the facilities to become familiar with the set-up at Suitland. The hours of operation are Monday through Friday 8 a.m. to 4 p.m. and Saturday from 8 a.m. to 5 p.m.

On the first visit, it is necessary for the researcher to obtain a research card. To obtain a research card, register at the guard's desk and be sure to bring two forms of identification. The guard will issue a research card which the researcher will need when he enters the research room on subsequent visits. Please be aware that there are very restrictive rules and regulations for conducting the physical research at Suitland. For example, food cannot be brought into the research room; purses, coats and umbrellas are not allowed in the research room; clothing cannot be removed in the research room, etc. Bring only necessary materials for conducting research. Paper is provided at Suitland. All materials will be inspected at the guard's desk and stamped and dated if

approved. Lockers are available for storage of personal items at a charge to the researcher (\$0.25). The research monitor will assign the researcher a seat from which his research will be conducted. This enables the research monitor to easily identify a researcher by name when his records are retrieved from the records warehouse located in the basement of the archives building.

At Suitland, fairly complete records exist for the World War II Infantry, Armor, and Airborne Divisions and for the Tank Destroyer Battalions (TDBN). The division and TDBN records include an assortment of G-1, G-2, and G-3 Reports, S-2 and S-3 Reports, After Action Reports, Journals, General Orders, message files, maps, and other miscellaneous records. There is an index of all unit records filed by division number identification. Ask the research monitor where the index is located. Within each division, infantry regiment records exist. The index informs the researcher what records exist for each unit and gives an archive file number for retrieval. For example, file number 330-INF(120) represents the 120th Infantry Regiment, 30th Infantry Division records; file number 603-0.3 represents 3rd Armored Division records. The first "3" in "330" is used at Suitland to represent infantry division records in Record Group (RG) 407 (European Theater of Operations); the "6" in "603" represents armored division records in RG 94 (The Adjutant General's Office). Tank Destroyer Battalion records are filed differently. To request these records, use file number TDBN-### and the date. For example, file number TDBN-644 December 1944 represents 644th Tank Destroyer Battalion records for the month of December 1944.

As a general rule, unit records do not provide sufficiently detailed information to support this study. Unit records were useful in providing some details such as times of events and unit casualties, but they contain little narrative information and almost nothing about units below battalion level. However, overlays in the records sometimes confirmed unit locations. The quality of After Action Reports varies greatly, but even the best usually do not have any details below the company level.

The most valuable records at Suitland for this study are the collection of interviews done by the European Theater historians. These narratives, titled "Combat Interviews", are richly detailed. For example, overlays accompanying the

interviews after Mortain had positions of individual anti-tank guns. However, there were no interviews done for some of the engagements specified for study by the task order. Further, SAIC has been unable to find similar information for other theaters or before 1944.

The Green Books are located in the research room at Suitland. There is also an additional index titled "Miscellaneous Lists." This index must be obtained from Mr. Boylan.

To request files, the researcher must fill out requisition forms with the file number indicated and give these forms to the research monitor. The research monitor in turn sends a research "gopher" to the records warehouse to retrieve the requested records. *(Hint: Be aware that this procedure may take from 45 minutes to as long as two hours, so make the file request before lunch to avoid the lunch break.)* Please be advised also that the research monitors will not accept requisition forms after 3 p.m. It is also possible to call and request that files be pulled before going to Suitland. The researcher should call the research room [(301) 763-3978] the day prior to coming to the research room. He must know the file number and preferably also the box number to make a request. This eliminates the waiting time for the arrival of the boxes from the warehouse.

The files will be brought to the researcher's table on a cart in labeled boxes. The researcher must initial, date, and put the time the cart arrived on the back of the requisition form. The research monitors are proud to enforce very restrictive rules and regulations for viewing the contents of the acquired boxes. The researcher can have only one box on the table at a time and can view only one file from that box at a time. While viewing the file, the researcher must keep the file on the table, i.e., he cannot set the file in his lap for viewing. He must also return the file to the box and the box to the cart before viewing the contents of the next box.

To xerox material, the researcher must mark the pages he wishes to xerox with a paper tab and take the entire folder to the research monitor's desk for approval. Paper tabs are provided at Suitland. There are three xerox machines available for use. Each uses coins or a debit card and the researcher must sign

up for a 30 minute block of time. Copies are ten cents a page and debit cards are available at Suitland for multiple xeroxing. (*Hint: Sign up for a 30-minute xeroxing block before having the files approved for xeroxing. This may save a little time by avoiding having to wait in line.*) Before xeroxing, obtain a slip of paper from the research monitor that must be attached to each page xeroxed. If this step is omitted, the guard will have to stamp each xeroxed page for approval upon leaving the research room. Rules and regulations also exist for xeroxing. Nothing larger than the glass plate on the xerox machine may be xeroxed. Large materials must be xeroxed by the archive personnel at an extra cost and extra time to the researcher (usually 6 to 8 weeks). The researcher is permitted to trace maps, however, he is not permitted to mark on the original document. Photographing material is also permitted. After xeroxing, tracing, or photographing necessary material, the researcher should list the Record Group, file number, and box number on each copy. This makes for easy retrieval for bibliographical references.

Once the researcher has completed his research, he must again initial, time, and date the back of the requisition form to return the cart to the warehouse. If the researcher is not able to complete the examination of the materials on his cart, he can request that the cart be held up to one week. (*Hint: To avoid confusion, always check with the research monitors to ensure the cart will be held. Otherwise, there is a chance the research materials will be returned to the warehouse.*) Upon leaving the research room, the researcher must sign out and have his research materials examined by the guard.

1.3.2 National Archives and Record Service, Washington, DC

Materials: *German Monographs*
Contact: *Mr. Harry Riley and Mr. Robin Cookson, Foreign Military Studies Dept*
Phone: *(202) 501-5667*

Many of the rules that apply at the archives in Suitland also apply at the National Archives in Washington, DC. The researcher should contact Mr. Harry Riley or Mr. Robin Cookson in the Foreign Military Studies Department at the National Archives and Record Service. They may be reached at (202) 501-5667. Inform Mr. Riley or Mr. Cookson of the research topic so they will be better

equipped to locate important research materials. The researcher must show his research card and sign in before entering the Archives. Bring only necessary materials for researching to the Archives. There are lockers available for personal items.

There is a Foreign Military Studies Directory/Index ordered by German unit available for use at the Archives. (*Hint: There are no US records at the Archives. Only German monographs may be retrieved.*) To retrieve monographs at the Archives, the researcher must fill out a requisition form. The xerox machines are located downstairs in the reading room. The researcher must sign up for a 30-minute block of time. Again, materials larger than the glass plate on the xerox machine may not be xeroxed. Upon completion of his research, the researcher must sign out before leaving.

1.3.3 US Army Center of Military History, Washington, DC

Materials: *Manuscripts, Unit histories, TDBN histories, the Green Books*
Contact: *Ms. Hannah Zeidlik, Reference Librarian*
Phone: *(202) 475-2562*

At the US Army Center of Military History (CMH), there is a limited library consisting of the Green Books, Unit histories, Tank Destroyer Battalion histories, and other secondary sources. To gain access to these sources, the researcher may use the card catalogue to search by engagement or by units involved. The reference librarian is there for assistance if necessary. These sources are useful in understanding the overall and background events of the actions, but do not contain specific information at the level of detail needed for this study.

In addition to the library, CMH has holdings of manuscripts written by CMH on various World War II battles. Ms. Hannah Zeidlik, the reference librarian, can assist in locating review copies of the manuscript file. The researcher must call and make an appointment with Ms. Zeidlik to get the index of manuscripts to determine which are appropriate for his research. The reference librarian may be reached at (202) 475-2562. After identifying these manuscripts, get the call numbers and have Ms. Zeidlik pull them from the files. If the call number is

known, it is also possible to call the reference librarian and have her pull the files before you arrive at CMH. The researcher should check with Ms. Zeidlik for the procedures on xeroxing. CMH only accepts money orders and personal checks for xeroxing. *(Hint: To avoid security problems, the researcher should send his security clearance to CMH for filing before conducting research.)*

1.3.4 US Army Infantry Center and School, Ft. Benning, GA

Materials: *Anti-tank and Tank Destroyer information, Monographs*
Contact: *Ms. Betty Van Sickle, Head Librarian*
Phone: *(404) 545-3390*

SAIC contacted Ms. Betty Van Sickle, the head librarian of the US Army Infantry Center at Ft. Benning, Georgia at (404) 545-3390. Based upon her recommendation, SAIC spent two days at Ft. Benning surveying the information there. Mr. Charles White, the Infantry Center historian, assisted in locating secondary sources. SAIC also contacted the Director of the Infantry Center Museum, Mr. Dick Grube, however, the museum did not have any relevant information for this project.

The library has a card index file which is well organized to support this project. The subject files include both anti-tank and tank destroyers. There are also monograph files isolated in the card index drawers. In addition to published sources, the library has a number of official World War II reports from overseas which were briefly researched for valid information for this project. In general, these reports served as lessons learned and general observations rather than detailed descriptions of engagements.

The most valuable resource at the Infantry Center is the monograph collection. Apparently, from 1947 to 1950, officers in the advanced course were required to write monographs about their experiences during the war. While their quality varies, some of the monographs are very detailed and focus on units as small as platoons. The monographs frequently used the footnote "personal knowledge" demonstrating that they included information which is unavailable elsewhere. Most of the monographs are still available as original documents, but all are available on microfilm.

1.3.5 US Army Armor Center and School, Ft. Knox, KY

Materials: Published books, Unit After Action Reports, Microfilm Archives
Contact: Mr. William Hansen, Librarian
Phone: (502) 624-6231

SAIC contacted and visited Mr. William Hansen, Librarian, at the US Army Armor Center at Ft. Knox, Kentucky. The first and most numerous sources are published books which are of minimal value to the search for primary source material. Shelby Stanton's US Army Order of Battle in World War II has been used, however, as a guide to determine which tank destroyer battalions and groups to research further. These tank destroyer battalions and groups are listed by equipment type, i.e., towed 3" gun, M-10, M-18, M-36, etc. This source helped narrow the examination of sources by limiting the search to records of towed tank destroyer units (which was the proposed scope of this initial effort). The quarterly magazine, After the Battle, was also used. While these articles have no bibliographies and cannot be used directly in this project, they provide background material to the reader who is unfamiliar with the larger scope of the small-scale engagements.

The second major asset of the Armor School Library is the collection of original records, including unit (down to battalion level) After Action Reports, battle experience analyses, and contemporary concept studies. These were searched exhaustively for any information at the level of detail that this project requires. While very little of these data are detailed, they may be useful for corroboration or to close the gaps in data from other sources.

The third source at the Armor School is the microfilm archives which also consist of primary document copies. These files were thoroughly reviewed for content pertinent to this project.

While at Ft. Knox, SAIC also visited the library of the Patton Museum of Armor and Cavalry, headed by Mr. David Holt. The museum library contains, almost exclusively, data on armored hardware; that is, technical information on tanks and other armored vehicles, weapons specifications, etc. Little data of value to this project are available, but some pertinent background or supplementary

data are available. The library contains the papers of COL R.J. Icks, a noted Ordnance historian.

1.3.6 The Library of Congress, Washington, DC

Materials: *Secondary sources not located elsewhere*
Contact: *No specific contact point*
Phone: *(202) 707-5700*

SAIC found research at the Library of Congress to be very confusing and, therefore, used this source only to locate secondary references not found elsewhere. The researcher should look up his topic in the card catalogue either by subject or by author if known. A requisition form must be filled out to obtain the research materials. The Library of Congress has both the English and German versions of various resources. On the requisition form, specify which version is desired.

SAIC obtained the requested books through interlibrary loan using the Corporate Technical Resource Acquisition Center (CTRAC); CTRAC is available to SAIC employees. The researcher should take the books to the loan office at the Library of Congress and fill out the required forms. They, in turn, will get the books to CTRAC where the researcher will pick them up. (*Hint: It is more convenient to get a blank, approved interlibrary loan application from CTRAC and take it to the Library of Congress. This enables the researcher to take the books directly from the library without waiting for CTRAC to acquire them.*) The researcher may return the research material to CTRAC or to the Library of Congress. He should inform CTRAC that the books have been returned to the Library of Congress upon completion of research.

1.3.7 German Archives

Materials: *Secondary German sources*
Contact: *Dr. Arthur G. Volz, Consultant*
Phone:

SAIC used one of our consultants in Germany, Dr. Arthur G. Volz, who reviewed his own extensive holdings and visited the Bibliothek für Zeitgeschichte

(Library for Contemporary History) and the Württembergische Landesbibliothek (Württemberg State Library) in Stuttgart. The Bibliothek für Zeitgeschichte has an extensive and detailed subject catalog which covers periodical literature and sections of books as well as complete works. Dr. Volz located several secondary source books which pertained to the Mortain battle. SAIC received the tables of contents and bibliographies from these books for further evaluation.

After comparing the requirements of this project with the available material located in Germany, Dr. Volz was not optimistic of finding information at the level of detail from the German records required by this project. In the later periods of the war, the German records become more skimpy than at the beginning, for instance, in North Africa. However, the material he did identify was useful for background information and for cross checking some of the information found in the American records. For example, it is not uncommon for the American and German records to differ in recapping the events of an action. At Hill 317 in Mortain, the German records report that virtually all armored vehicles seem to have been APCs, with only four assault guns engaged; yet the American records state the Germans launched "another bitter attack with a large force of tanks."

1.3.8 US Army Military History Institute, Carlisle, PA

Materials: Tank Destroyer Battalion records, Collection of 14 unnumbered boxes
Contact: Mr. John Slonaker, Director
Phone: (717) 245-4114

SAIC visited the Military History Institute to examine any information there on tank destroyers. There is a special reference file the library has prepared on tank destroyer battalions. Much of the material is available at the Washington National Records Center, Suitland, MD; however, there are some historical unit data that was not found elsewhere. SAIC obtained a copy of the file which might be useful to specific cases. It is File #47 and may be found in SAIC's files.

The Andrew Bruce papers were examined from which the booklet ID Combat in Tunisia was copied (Andrew Bruce was involved with tank destroyer ordnance during

World War II and afterwards). This is probably the best source for the battle at El Guettar, Africa. In addition, fourteen unnumbered boxes containing The George B. Jarrett Papers are located on the second floor in the archives. The collection has not yet been arranged, and most of the contents are in unlabeled folders. More than half of it is personal papers or clippings from published magazines and newspapers. Several boxes contain material of possible value to this project.

There were a small number of TDBN histories but few of these addressed the detail desired. The 607th, 811th, and 628th did have some, but these are also available at CMH in Washington.

1.3.9 The Pentagon Library, Washington, DC

Materials: *the Green Books, Unit histories, Periodicals*
Contact: *Reference Librarian*
Phone: *(703) 697-4301*

To use the Pentagon Library, the researcher needs a DoD badge or an escort to enter the Pentagon. Once inside the library, it is necessary to use the automated filing system to search for research topics by keyword, author, or title. The US Army Official History of World War II, the "Green Books," and a fairly complete set of Unit Histories are at the Pentagon Library. These books aided the researcher by providing background material for the engagements being researched. Periodicals are also available at the library. Back issues are on microfiche. See the librarian for use of these machines. There is a xerox machine in the Pentagon Library. There is usually a line for using the xerox machine.

1.3.10 Ft. Belvoir Library, Ft. Belvoir, VA

Materials: *Secondary sources*
Contact: *Reference Librarian*
Phone: *(703) 664-1140*

To conduct research at the Ft. Belvoir Library, the researcher should look up his topic in the card catalog by subject, author, or title. Most of the

sources here are also located elsewhere, therefore, SAIC only retrieved a few references of use to this study.

1.3.11 US Military Academy, West Point, NY

Materials: No information available for this study
Contact: Mr. Hoss, Documents Librarian and Ms. Dawn Crumpler, Special Collections
Phone: (914) 938-2230/2954

SAIC contacted Mr. Hoss, Documents Librarian, and Ms. Dawn Crumpler, Special Collections. Neither of these librarians located any sources at the USMA library with the details required for this project.

1.3.12 US Army Artillery Center and School, Ft. Sill, OK

Materials: No information available for this study
Contact: Dr. Dastrup, Historical Office and Ms. Relph, Librarian
Phone: (405) 351-6183/4525

SAIC contacted Dr. Dastrup of the Historical Office and Ms. Relph, the librarian at the US Army Artillery Center and School in Ft. Sill, Oklahoma. Data at the level of detail required were not available, however, the Center did have some general tank destroyer information. In particular, a document on the 1948 Anti-tank Conference is available and can be borrowed through library channels.

1.3.13 US Army Combat Studies Institute, Ft. Leavenworth, KS

Materials: No information available for this study
Contact: Mr. John Rogers, Reference Librarian and Ms. Tina Byers, Information Services
Phone: (913) 684-4035

SAIC contacted Mr. John Rogers, Reference Librarian, and Ms. Tina Byers, Information Services. Neither individual believed that Leavenworth holdings could assist this project as any relevant information has been sent to the US Army Military History Institute in Carlisle, PA.

1.3.14 US Air War College, Maxwell Air Force Base, AL

Materials: No information available for this study
Contact: Assistant Librarian
Phone: (205) 293-2888

SAIC contacted the assistant librarian at the US Air War College about relevant information for this project. The librarian confirmed that the Air War College has virtually no information of any specific anti-armor action relative to land forces in a defensive mode.

1.3.15 US Army Combat Developments Experimentation Command, Ft. Ord, CA

Materials: No information available for this study
Contact: Assistant Librarian
Phone: (408) 242-2211

The assistant librarian at the US Army Combat Developments Experimentation Command was contacted by SAIC. No historical information relevant to this project was available.

1.3.16 Network of World War II Veterans

Materials: First-hand data not available anywhere else
Contact: Local representative of appropriate military unit
Phone:

Dr. Charles M. Baily (SAIC) contacted the Tank Destroyer Association for a unit representative/historian in order to start a network to identify surviving World War II veterans to assist in providing information to this study. One phone call led to another and soon Dr. Baily had a list of men who were willing to provide additional resources for this study. (*Hint: Some veterans simply declined to be interviewed because their memories were too painful.*)

Upon forming this network of veterans, Dr. Baily performed a qualitative evaluation and assessed their competence of the events that took place based on the following criteria:

- Could they remember their involvement in a war that took place 46 years ago, i.e., detailed events of occurrences, location of their unit, what they and/or their unit contributed, etc.? *(Hint: In some instances, veterans honestly stated, "I just do not recall" when asked specific questions about their involvement.)*

- Were the veterans combat leaders who were actively involved in combat? *(Hint: SAIC found that combat leaders had more recollection of events than those who were more passively involved.)*

- Did the veteran's recollection corroborate with the written sources? *(Hint: Based on their knowledge, some veterans were able to clarify and correct the written records as to placement of their guns, number of rounds fired, etc.)*

SAIC's initial access to the World War II veterans was courtesy of the Tank Destroyer Association's local representative, COL (Ret) Quintus Atkinson at (703) 435-1505. Dr. Baily was able to contact several veterans from which four agreed to provide oral histories based upon their experience and recollection. These interviews proved to be an excellent source of information, both for confirming and adding to the written record data that had been collected. Although the war ended 46 years ago, they still had vivid memories of events that have never been recorded. On occasion, the interviews served to correct official reports on such data as gun positions and were also able to fill in details that were not recorded.

SAIC has successfully used this method in identifying World War II veterans of US Army Infantry Divisions and more specifically of associated anti-tank companies. Dr. Baily has developed a rapport with several veterans which enables him to continuously receive otherwise inaccessible information while his network of veterans continues to grow.

1.4 DATA COLLECTION OBJECTIVES

The Statement of Work included several references to desired data for anti-tank actions. Since the lists differed in some instances, further discussions were held with the Technical Monitor in order to consolidate and prioritize the data requirements. Table 1-4 presents the list of data collection objectives, ordered by those data elements required for an action to be of any value

(primary), additional data that should be compiled (secondary), and those data that would be good to have as well (tertiary).

TABLE 1-4. DATA COLLECTION OBJECTIVES

PRIMARY	SECONDARY	TERTIARY
Disposition of defensive weapons/location relative to attack	Artillery bombardment	Type of attack maneuver
Strength of US infantry	Obstacles	Quality of defensive preparation
Size and activity of infantry with armor attack	Meteorological data	Extent of warning and intelligence
No. and type of AT weapon in visual contact with the enemy	Time of day	Air/Artillery support and suppression
No. of enemy tanks, armor SP guns	Terrain	Overwatching vs. maneuvering tanks
US tanks present	Maximum operational effectiveness range	Supply of on-hand ammunition
Casualties (personnel)	Rounds fired by type	
No. and type of tank, SP gun casualties (enemy)	Maps	
Narrative		

1.5 DEVELOPING AN ENGAGEMENT DATABASE

Using the software package REFLEX, SAIC has allowed for a separate database for each engagement researched. Each record in the database consists of nine fields:

- Unit
- Date
- Time
- Nationality
- X-coordinate
- Y-coordinate
- Location
- Action
- Source.

The researcher reads through the data files of an engagement and picks out the pertinent information. This pertinent information is determined by the research

data collection objectives discussed above. The data is entered into the database verbatim. Any sentence or paragraph in a document that has a specific time mentioned is a prime candidate for a separate record in the database. If no specific time is mentioned, the researcher may make an educated guess as to the time. For example, "shortly after noon" may be represented as 12:05 p.m. or 12:10 p.m. to ensure proper chronological placement in the database. *(Hint: When the researcher locates weather conditions for a particular day, he should give the record a time of 0000 and the date to appear as the first record on that day. The researcher should give "summary" types of information a date and time to appear at the end of the database. For example, "the battalion lost 427 men in the battle" would be given a date and time to appear at the end of the database.)*

When the researcher has completed his research, REFLEX allows the researcher to sort the database chronologically by specified fields. This allows for cross checking of data from different sources to determine discrepancies and to identify places where data is lacking. It also provides a relatively easy method for writing the narrative of events and tracing the action on maps.

1.6 DETERMINING WHAT IS AN "ACTION"

At the completion of the database, an "action" is determined by the amount of primary data objective material available. Tables were created in order to collect the primary data objectives. As combat actions were identified, a table was created and the data filled in. The source of the data was also noted in the table. Each combat action has an associated data table.

1.7 THE FILING SYSTEM

SAIC reproduced all original source data and much of the secondary source data that was used in this project. The reproduced data was compiled, indexed, cross-referenced, and organized into systemized data files for efficient ready reference and future analysis. Each item of information was placed in a folder and the folder labeled as to the content. An index was developed which cross-

references all the material in the folders. The index is sorted in the following ways:

1. All material indexed by Unit
2. All material indexed by Engagement Name and Number
3. All material indexed by Date of Occurrence
4. A miscellaneous index for all material that does not fit into the above categories.

There is an additional index that sorts the material by folder number. All data sources researched by SAIC appear in a separate bibliography.